10. Two commenters requested that EPA consider using perozone oxidation as the method of VOC treatment for the Glendale North OU interim remedy.

EPA Response: As a result of these comments, EPA carefully re-evaluated the use of perozone oxidation for the Glendale North OU. Additional research on perozone use and revised cost estimates based on a bench scale treatability study can be found in the following technical memorandum: Applicability of Perozone Process for the Glendale North Operable Unit Groundwater Remediation (March 12, 1993) included in supplement 1 of the Administrative record for the Glendale North OU available at all five information repositories for the San Fernando Valley Superfund site.

As previously stated above in EPA's responses to Comments 3 and 7, while EPA was able to determine that perozone has been used for some larger-scale projects, the contaminants involved were not always similar to those found in the groundwater of the Glendale North OU study area. Therefore, use of perozone for the Glendale North OU would be one of the largest VOC treatment applications of the technology. In addition, the effectiveness of using the perozone technology to oxidize contaminants in the groundwater depends on the contaminants present; for instance, TCE, PCE, and dichloroethylene (DCE) are treatable, but carbon tetrachloride, a potential Glendale North OU contaminant, is not as easily or effectively treated by the perozone technology. Perozone has limited application to the Glendale North OU because contaminants such as carbon tetrachloride which cannot be effectively treated using this technology are present above drinking water standards in the north plume of groundwater contamination in the Glendale Study Area. Also, as stated in the feasibility study report for the Glendale North OU, incomplete oxidation can lead to the formation of by-products such as formaldehyde. Additional VOC treatment such as air stripping or liquid phase GAC would be required after the perozone process in order to ensure that the treated groundwater would meet all drinking water standards for VOCs. EPA's proposed Alternative 3 includes these polishing treatment technologies, but unless they are redundant systems, any problems or failures associated with the perozone process would result in the project shutdown. In addition, by-products of the perozone process that cannot be addressed by liquid phase GAC or air stripping would not be addressed by EPA's proposed Alternative 3.

Finally, in a letter dated September 8, 1992, the California Department of Health Services Office of Drinking Water (ODW) stated, "ODW considers the hydrogen peroxide/oz
one process to be an experimental one and not a proven technology. Therefore, we cannot give approval to this technology at this time." (Also, please see State Comment 6.)

All of these factors, coupled with the uncertainties associated with design, uncertainties with regard to capital and

operational costs, reliability, and finally the fact that a municipality will be counting on receiving this water, all combine to make air stripping or liquid GAC preferable to VOC treatment by perozone oxidation for the Glendale North OU.

11. A commenter notified EPA of an alleged child cancer cluster in the Glendale area. The commenter reported that 22 children living in the Glendale area have developed Hodgkin's disease and other cancers over the last five to ten years. The commenter wanted to know how the Glendale North OU would address this problem.

EPA Response: The Glendale North OU was not conceived to specifically address this problem. However, the OU should reduce the risk to human health for persons who, while it is unlikely, could be exposed to the untreated groundwater from the upper zone of the aquifer.

In addition, upon receiving this comment, EPA immediately contacted the Los Angeles County Department of Health Services (DHS) because the County DHS is required to take the lead in initially responding to the concerns of this type. EPA learned that the County had received a similar letter regarding the cluster of Hodgkin disease in the City of Glendale and that the County DHS was in the process of initiating an investigation. In a letter dated March 21, 1993, the County DHS informed EPA that the investigation was complete and that while there were a large number of Hodgkin's cases, there was no evidence of a Hodgkin's Disease cluster in Glendale. This letter is included in Supplement 1 to the Glendale North OU Administrative Record File available for review at the information repositories listed in Appendix A. County DHS also notified the commenter directly of their findings. For further information regarding the County DHS investigation, the public should contact Dr. Paul Papanek, Director of the Toxics and Epidemiology Program for the Los Angeles County Department of Health Services or Philip Jacobs of his staff at (213) 744-3235.

COMMENTS FROM THE CITY OF GLENDALE

1. The City requested that EPA conduct an evaluation of the various technologies for the removal of VOC's from the groundwater in Glendale.

EPA Response: EPA has evaluated a number of technologies for the treatment of VOCs in the extracted groundwater. After screening all of these technologies, which are described in detail in the Feasibility Study for the Glendale Study Area North plume Operable Unit (April 1992), EPA included three VOC technologies in its final alternatives. These technologies include: air stripping, liquid phase GAC, and advanced oxidation using hydrogen peroxide and ozone (commonly referred to as perozone).

2. The City requested that EPA review the advantages of using perozone oxidation as its preferred alternative because it could be technically superior to air stripping and less expensive.

EPA Response: Please see EPA's Response to Community Comments 3,7, and 10 above. In addition, EPA conducted a bench scale treatability study for perozone using contaminated groundwater from the Glendale North OU Study Area. This study is described in greater detail in the following technical memorandum: Applicability of Perozone Process for the Glendale North Operable Unit Groundwater Remediation (March 12, 1993) included in Supplement 1 of the Administrative Record for the Glendale North OU available at the information repositories for the San Fernando Valley Superfund sites (see Appendix A). The results of this study were used to better refine the cost estimates for perozone. The study found that the Total Present Worth cost of Alternative 3 was increased by approximately $500,000. Therefore, the cost of the perozone alternative was found to have been underestimated. The revised cost is fairly close to the costs associated with Alternative 2 which would use air stripping or liquid phase GAC. In addition, all costs provided in the FS report for the Glendale North OU are estimates and under EPA guidance actual costs may differ as much as plus 50 percent or minus 30 percent. Therefore, the perozone alternatives would necessarily be less expensive than alternatives that use other technologies for the treatment of VOCs.

3. The City stated that it would like to accept the treated water from an EPA treatment facility into its water distribution system. The City further stated that to discharge this high quality water into the Los Angeles River would clearly be a waste of water and send the wrong message to the public on water resources planning.

EPA Response: EPA agrees with this comment.

4. The City stated that the EPA cleanup activities are directed at the upper aquifer where the highly contaminated water is located. However, significant levels of contamination are found in the upper regions of the lower aquifers. EPA's Proposed Plan for the Glendale North OU does not address cleanup of the lower aquifers which is a problem because this is where the City of Glendale's long-term water supply will come from. The City further stated that EPA needs to address contamination in all aquifers of the San Fernando Valley Groundwater Basin.

EPA Response: EPA would like to emphasize that the Glendale North OU is an interim action. This interim action was specifically developed to address contamination in the shallow-most groundwater of the Glendale Study Area. The objectives of this interim remedy are to begin to remove contaminant mass from the shallow-most aquifer and to inhibit the further migration of contamination in the shallow-most aquifer both laterally and vertically. Thus, with regard to the Glendale North OU interim remedy, it is not EPA's obj

ective to restore the shallow or deeper aquifers of the Glendale area nor is it to provide the City of Glendale with a long term water supply. However, this interim action will help protect the lower aquifers from further contamination by inhibiting migration and initiating mass removal by pumping from the most highly contaminated zones. In addition, should the City of Glendale agree to accept the treated water, it would be able to exercise some additional water rights which are currently not useable due to the VOC contamination.

5. EPA's preferred alternative identifies blending out the nitrates in the treated water from the upper aquifer with imported water from a new connection on the Metropolitan Water District (MWD) distribution system. The City indicated that it is concerned with this approach because it further ties the City's water supply with imported water availability. The City suggested that EPA investigate the possibility of blending the upper aquifer treated water with lower aquifer untreated water to meet the nitrate MCL.

EPA Response: EPA does not intend to explore this option. EPA continues to support the use of MWD water for blending. See EPA's Response to Community Comment 9 above.

6. The City indicated that the 3,000 gpm extraction rate of EPA's preferred alternative is too small considering the City's water rights and needs and the extent of the problem and suggested that an extraction rate of 6,000 gpm would be more appropriate.

EPA Response: During the feasibility study, EPA used a computer model to determine what the optimal extraction rate would need to be to meet the above referenced objectives. The optimal extraction rate was determined to be 3,000 gpm. Higher extraction rates were found to dilute the groundwater contamination that would be pulled into the treatment plant to such a degree that the objectives of optimal mass removal and inhibition of migration would not be met. The extraction rate of 3,000 gpm was determined to be optimal in order to meet the objectives of the Glendale North OU interim remedy. If the Glendale North OU were to include pumping at rates greater than 3,000 gpm, the remedy would likely fail to meet its objectives of prohibiting further downgradient migration and optimizing mass removal from the most highly contaminated portion of the upper aquifer. Additional pumping for the Glendale North OU would also result in a reduction in cost effectiveness of the remedy.

Nevertheless, EPA understands that the City has a significant stored water credit and that the City is interested in receiving a larger volume of water and has the water rights to additional water. As discussed in the ROD, EPA has determined that combining the treatment plant locations for the Glendale North and Glendale South OUs and providing the treated water from both OUs to the City would probably result in a significant cost savings for both OUs

and appears to be implementable since the City has indicated a willingness to accept the additional treated water from the Glendale South OU. Therefore, EPA has determined that the treatment plants for the Glendale North and South OUs will be combined and the total 5,000 gpm of treated water will be conveyed to the City of Glendale (please see ROD Section 11, the Selected Remedy, for a more detailed discussion). Using a conservative blending ratio of 1:2 (treated water to MWD water) to meet the nitrate MCL, the City could receive as much as 15,000 gpm total of water.

7. The City stated that it looks forward to working with the EPA on an appropriate site for the facility. One consideration is a location that can fit best into existing and proposed facilities.

EPA Response: EPA agrees with this comment. The final design and location of the extraction wells and the VOC treatment plant will be determined during the remedial design phase.

8. The City stated that it needs to expand its well production capacity for the San Fernando Valley to 10,000 gpm to 12,000 gpm, whether by the EPA cleanup program alone or in conjunction with the EPA.

EPA Response: Again, the Glendale North OU is an interim OU and would extract and treat 3,000 gpm of VOC-contaminated groundwater for 12 years. In order to meet the nitrate drinking water standard, a conservative blending ratio for treated water to MWD water of 1:2 would potentially make available to the City of Glendale as much as 9,000 gpm total for the Glendale North OU. With the additional water from the Glendale South OU and the blending of that water for nitrate (at 1:2), the total amount of extracted, treated, blended water potentially available to the City from both OUs could be as much as 15,000 gpm.

9. The City requested that EPA develop a "master plan" to clean up the San Fernando Valley Groundwater Basin to hopefully avoid conflicts at a later date, as new groundwater projects are proposed.

EPA Response: EPA has not developed a "master plan" as part of the Glendale North OU interim remedy. However, EPA is not only conducting interim groundwater OU remedies to address the "hot spots" of groundwater contamination but is also working toward an overall solution to the basinwide contamination problem both in the groundwater and in the soil of the San Fernando Valley.

10. The City described its goals for the Glendale North OU interim remedy to include:

1) A program and corrective plan that gives appropriate consideration to the water needs of Glendale's 184,000 residents.

2) A program that addresses water quality problems in all aquifers.

3) A program that does not depend on imported water.

4) A program based on a comprehensive water resource plan for the area that would include EPA and City facilities, and involve all parties to avoid future conflicts.

EPA Response: While these are the goals of the City of Glendale for the Glendale North OU, these are not precisely the same as EPA's goals for this interim OU remedy which are to protect human health and the environment consistent with the requirements of the NCP. All of these points have been addressed in previous responses above. However, EPA hopes that the Glendale North OU interim remedy, as well as other actions being taken on the San Fernando Valley sites, will address some portion, if not all, of the City's goals while at the same time, meeting EPA's objectives and mission.

RESPONSIVENESS SUMMARY - PART II

COMMENTS BY THE STATE

1. The California Regional Water Quality Control Board (RWQCB) stated that it is not clear what evaluations will be made during operation of the remedy to determine whether the objective of inhibiting plume mitigation is being achieved or what measures will be implemented to either expand or supplement the cleanup plan if the goals are not achieved.

EPA Response: EPA will be conducting a five-year review of this OU pursuant to Section 121 of CERCLA. During these reviews, the effectiveness of the remedy at meeting its remedial objectives is evaluated. If necessary, EPA will make changes to the remedy either through an explanation of significant differences (ESD) or a ROD amendment to ensure that the remedy meets its remedial objectives. In addition, the operation of the OUs will be evaluated in the basinwide FS and final ROD.

2. The RWQCB stated that while it supports EPA's preferred alternative, the alternative "falls short" because it does not restore the beneficial uses of the groundwater in the upper portion of the aquifer.

EPA Response: Again, the Glendale North OU is an interim action. This interim action was specifically developed to address

contamination in the shallow groundwater of the Glendale Study Area. The objectives of this interim remedy are to begin to remove contaminant mass from the most contaminated portions of the upper aquifer and to inhibit the further migration of this contamination both laterally and vertically. Thus, with regard to the Glendale North OU interim remedy, EPA does not expect to restore the beneficial uses of the groundwater. However, this interim action will help protect the lower aquifers from further contamination by inhibiting migration and initiating mass removal by extracting water from the most highly contaminated portion of the aquifer, and is consistent with the potential goal of restoration of the groundwater.

EPA is also working on an overall solution to the basinwide contamination problem both in the soil and the groundwater. In the meantime, restoration of the aquifer(s) will be evaluated as part of EPA's overall RI/FS of the San Fernando Valley.

3. The RWQCB requested that EPA clarify the source(s) of water to be used for blending to meet the nitrate drinking water standard and that using lower zone water should be evaluated to ensure there will not be any vertical migration of the contamination plume.

EPA Response: As stated above in EPA's responses to Community Comment 9 and City of Glendale Comment 5, EPA strongly suggests that the source of water for blending to meet the nitrate drinking water standard (MCL) be from the Metropolitan Water District (MWD) and not from deeper portions of the aquifer.

4. The RWQCB offered support for EPA's preferred alternative for the Glendale North OU but requested to go "on record" as favoring direct use of the treated groundwater as opposed to reinjecting it. Further, the RWQCB stated that any reinjection of the treated water would require proper siting to enhance the overall cleanup.

EPA Response: EPA accepts and agrees with these comments. Siting of any reinjection wells to enhance the overall cleanup would be done to the extent practicable.

5. The Department of Health Services, Office of Drinking Water (ODW) stated that the City of Glendale will need to obtain a water supply permit and that DHS will need to review the design, construction, operation, reliability, monitoring and maintenance of the facilities involved in this project before they issue such a permit.

EPA Response: Whether or not a permit will be required is dependent upon whether or not the action occurs onsite or offsite. CERCLA Section 121(e) provides that "[n]o Federal, State or local permit shall be required for the portion of any removal or remedial action conducted entirely onsite, where such remedial action is selected and carried out in compliance with this section."